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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/829,614	04/22/2004	Paul L. Falkenstein	NC 96,039	7320

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EXAMINER	
DEHGHAN, QUEENIE S	
ART UNIT	**PAPER NUMBER**
1731	

DATE MAILED: 06/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/829,614	FALKENSTEIN ET AL.	
	Examiner	Art Unit	
	Queenie Dehghan	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *18-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election of Group I, claims 1-17 in the reply filed on May 15, 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Specification

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The abstract of the disclosure is objected to because it exceeds 150 words.

Correction is required. See MPEP § 608.01(b).

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claim 4 recites a partial vacuum of a few psi. However, the

specification discloses a partial vacuum of a few Torr on page 9. The only time a few psi is referred to is when discussing a positive pressure on page 13. Furthermore, claim 16 recites a graphite tube and the specification does not disclose a graphite tube.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

5. Claims 4-9, 11, and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. The term "few psi" in claim 4 is a relative term, which renders the claim indefinite. The term "few" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

7. Claim 6 recites the limitation "the method of claim 7" in line 1. There is insufficient antecedent basis for this limitation in the claim. Claim 6 will be interpreted as dependent on claim 5.

8. Claim 7 recites the limitation "the method of claim 8" in line 1. There is insufficient antecedent basis for this limitation in the claim. Claim 7 will be interpreted as dependent on claim 1.

9. Claim 8 recites the limitation "the method of claim 6" in line 1. There is insufficient antecedent basis for this limitation in the claim. Claim 8 will be interpreted as dependent on claim 1.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1, 3, 7, 10 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Berkey et al. (US 2004/0050110). Berkey et al. disclose a method for making holey fiber comprising stacking structures of at least two different materials (one being graphite rods) of lower and higher softening points, heating the bundle to a fusion temperature to close the interstices between the tubes, removing the structures of the higher softening point material to form channels in the fused element, and drawing the preform to form the holey fiber ([0008], [0047], [0056]). Furthermore, Berkey et al. disclose using graphite rods as the higher softening point structure that is removed via heating in an oxidizing environment ([0034], [0074]). Berkey et al. also disclose holey fiber made from silica glass ([0051]). In addition, Berkey et al. disclose the step of applying a vacuum to the bundle to remove air ([0047]).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 1, 7-9, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fekety et al. (6,917,741) in view of Large et al. (US 2005/0147366) or Chesnoy et al. (5,792,233). Fekety et al. disclose a method for making holey fiber comprising stacking glass tubes to form a bundle (col. 1 line 66 to col. 2 lines 3, 24-30, col. 4 line 16) with interstices between the structures (col. 4 lines 36-37), wherein the structures are of at least two different materials of lower and higher softening points (col. 7 lines 56 to col. 8 lines 5), removing the structures of the higher softening point material from the arrangement (col. 2 lines 2-3), and drawing the preform at a draw

temperature which is below the softening point of the lower softening point to form a holey fiber (col. 2 lines 8-10, col. 8 lines 5-9). However, Fekety et al. fail to disclose the fusing of the structures at a particular temperature. Large et al. teach of stacking glass canes with a lower softening point and glass tubes with a higher softening point and subsequently fusing them together at a temperature below the softening point of the higher softening point material to retain its shape and the lower softening point material softens ([0004], [0005], [0041], [0045]). Chesnoy et al. also teach securing structures together by fusing them over the entire lengths and filling interstices with rods made of vitreous material (col. 2 lines 23-26, col. 4 lines 42-45, 54-58). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the fusing step and temperature of Large et al. or Chesnoy et al. in the method of making holey fiber by Fekety et al. in order to better maintain the position and rotational orientation of hole structures, as suggested by Large et al. and Chesnoy et al.

15. Regarding claims 9 and 11, Fekety et al. applied an acidic aqueous solution to etch out the core (col. 5 lines 15-17) of an optical fiber preform, which comprises stacking glass tubes such that the higher softening point tubes are placed in the central region of the bundle (col. 4 lines 14-22, col. 8 lines 3-6) for forming holey fiber with a hollow core (col. 4, lines 6-8).

16. Regarding claim 12, Fekety et al. disclose a step of applying a partial vacuum to the bundle to remove air therefrom (col. 5 lines 11-15) and the insertion of the preform into a clad tube (col. 5 lines 23-24), but do not disclose inserting a holey fiber into a clad tube and drawing the complex structure. Large et al. suggest the suggest the

subsequent steps of inserting holey fiber into a clad tube and drawing the structure to form a holey fiber of reduced cross section ([0074]). It would have been obvious to one ordinary skill in the art at the time the invention was made to utilize the further cladding and drawing steps of Large et al. in the method of Fekety et al. in order to control the size of the final fiber.

17. Regarding claim 13, Fekety et al. disclose placing the structures into a glass clad tube and the spaces between the tube and the structures are filled (col. 4 lines 36-37). Both the clad tube and structures are glass, which provides them with the same lower softening temperature.

18. Claims 2, 14, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fekety et al. (6,917,741) in view of Large et al. (US 2005/0147366) or Chesnoy et al. (5,792,233), as applied to claim 1 above, and over Berkey et al. (US 2004/0050110), as applied to claim 15 above, in further view of Fajardo et al. (6,847,771). Neither Fekety et al. nor Berkey et al. disclose the fusion and drawing temperatures of the holey fiber preform. Fajardo et al. teach utilizing appropriate fusion and drawing temperatures that allow for lower softening point material to fuse without distorting the shaped holes of the higher softening point material (col. 8 lines 41 to col. 9 lines 43, col. 11 lines 1-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the fusing and drawing temperatures of the preform, as suggest by Fajardo et al. in the method steps of Fekety et al., Large et al, and Chesnoy et al. or Berkey et al. in order to prevent distortion of the holes in the preform and fiber.

19. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fekety et al. (6,917,741) in view of Large et al. (US 2005/0147366) or Chesnoy et al. (5,792,233), as applied to claim 1 above, in further view of Sato et al. (7,026,025). Fekety et al. further disclose a step of applying a partial vacuum to the bundle to remove air therefrom (col. 5 lines 11-15), but do not teach of the magnitude of the vacuum. Sato et al. teach of applying a vacuum to bundle of glass rods while it is heated at a pressure of a few psi (around 100mmHg) (col. 4 lines 60-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the vacuum of Sato et al. in the method for forming holey fiber of Fekety et al., Large et al., and Chesnoy et al. in order to eliminate the gaps between the glass tubes, as taught by Sato et al. Regarding claim 5, Fekety et al. disclose stacking structures of higher softening point material in the inner portion of the preform and structures of lower softening point material in the outer portion of the preform (col. 7 lines 56-59). Fekety et al. further provide an example where the structures of the lower softening point material are the glass filler rods and the structures of the higher softening point material are glass tubes (fig. 14, col.10 lines 10-18).

20. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fekety et al. (6,917,741) in view of Large et al. (US 2005/0147366) or Chesnoy et al. (5,792,233), and Sato et al. (7,026,025), as applied to claim 5 above, in further view of Sanghera et al. (US 2005/0025965). Fekety et al. disclose an example where a glass tube of 1.5mm outer diameter and 1.3mm inside diameter where used, but do not disclose the diameter of the filler rods used (col. 10 lines 17-18). Sanghera et al. teach an example of

stacking glass tubes and rods to form a holey fiber preform, where rods used had an outside diameter of 0.9mm ([0033], [0034]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the rods of Sanghera et al. in the stacked structure of Fekety et al., Large et al, Chesnoy et al. in, and Sato et al. in order to provide mechanical integrity to the stacked structure, as suggested by Sanghera et al.

21. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berkey et al. (US 2004/0050110), as applied to claim 15 above, in view of Fekety et al. (6,917,741) and Sato et al. (7,026,025). Berkey et al. do not disclose the diameters of the structures used in the holey fiber preform. Sato et al. teach using glass rods with an outer diameter of 1mm (col. 6 lines 30-31). Also, Fekety et al. teach of using rods and tubes, where the tubes have an inner diameter of 1.3mm and outside diameter of 1.5mm (col. 10 lines 17-18). Since Berkey et al. disclose the use of graphite rods in the fabrication of a holey fiber preform, and Fekety et al. teach using rods and tubes interchangeable and together, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize graphite tubes with the dimensions suggest by Fekety and the rods Sato et al. with an outer diameter of 1mm in the method for forming holey fiber of Berkey et al. in order achieve a holey fiber of a desired value.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Queenie Dehghan whose telephone number is

(571)272-8209. The examiner can normally be reached on Monday through Friday 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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